



PLUMBING SHOP

Introduction

Plumbing refers to installation of pipelines, water tanks and other pipe fittings to distribute water in a building. Plumbing is an art of laying the pipe line for the transportation of fluid and gas from one place to another, so plumbing involves joining of various pipes by different joints and fitting in the pipe line

Best practices

1. Loose clothing should be avoided.
2. Wear shoes while working in the shop.
3. Tools should be placed in their respective places after proper cleaning.
4. Always use the right tool for the job.
5. Keep the cutting tools separate from the measuring tools.
6. Sharp edges of the cutting tools should be covered when they are not in use.

Plumbing Tools

Plumbing tools are many. The following tools are commonly used to install 25mm size pipelines. PVC (Poly Vinyl Chloride) pipes and GI (Galvanized Iron) pipes are commonly used in plumbing.

Following tools are used in the common plumbing working up to medium size (10 cm/ 100 mm) pipes.

- 1) Hacksaw
- 2) Pipe Wrench
- 3) Pipe Vice
- 4) Pipe fittings
- 5) Valves and Taps
- 6) Ratchet type die holder
- 7) Screw Driver
- 8) Chain-wrench
- 9) Hammer
- 10) Measuring tap
- 11) Pipe Cutter
- 12) Bench Vice



1) **Hacksaw:** It is used for cutting of pipes. Figure 1 shows a hacksaw commonly used, it essentially consists of a frame, Handle, Prongs, tightening screw and nut. The blade is fixed in position and tightened by means of the tightening screws.



2) **Pipe wrench:** A pipe wrench is used to hold and rotate the pipes to tight them. It consists of a fixed jaw, a movable jaw with adjusting screw.



3) **Pipe vice:** A pipe vice is used to hold the pipe during cutting, making threads at the ends of the pipe, fitting of couplings, etc. It also consists of a fixed jaw, a movable jaw and a screw with handle for adjustment.



4) **Pipe Fittings:** A PVC pipe connection uses fitting like elbow, bend, coupling, tee reducer, etc. Fitting like couplings, elbow, bend, union, nipple, tee reducer, plug, cap, flange, etc. with V-threads are commonly used in GI pipe connections.





5) Valves and Taps: A gate valve or globe valve is commonly used in the main pipeline to control/regulate the flow of water through it. Valves are usually made of cast iron or brass. A domestic tap is commonly used to collect or tap water at desired points in the pipelines. Taps are made of brass, steel or plastic.



6) Ratchet type die holder

This unit can be used on black iron or galvanised pipework which is in situ or on loose pipes. If the pipe is loose it must be held securely in either a pipe stand and vice or a bench mounted vice



7) Screw Driver: Screw drivers are used to tighten screws in the appliances. Screw drivers of various sizes are used.





8) Chain Wrench

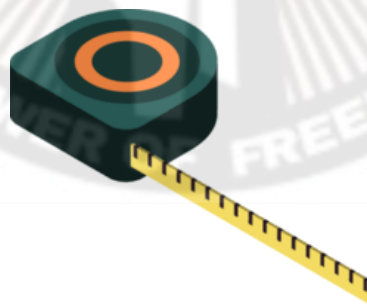
A chain wrench is any of various types of wrench that grip an object via a strap or chain being pulled in tension around it until it firmly grips. High static friction keeps it from slipping. Many strap wrenches have built-in handles.



9) **Hammers:** Ball peen hammer is commonly used in plumbing work where greater power is required in striking.



10) **Measuring Tape:** A measuring tape is used to measure the length of the pipe and also to mark the locations of the fittings, valves and appliances.



11) **Pipe Cutters:** This is a manual tool used to cut a pipe at the work site, especially when it is difficult to use a hacksaw frame. This tool has a sharp, round cutting wheel which is pressed with to and fro rotary motion for cutting a pipe





12) Bench Vice: A vice is a tool used for holding an object for various tasks like filing, chipping, sawing, threading, tapping, bending, etc. The bench vice has two jaws, one of which is fixed and the other is movable. These jaws are fitted with plates for a better grip on the object during the task.



Safety During Handling Tools

The following precautionary measures may be taken for the safe use of the plumbing tools.

1. Use the correct methods given in the 'Instruction Manual of tools' while using them.
2. Use the appropriate tools required for the specific work or job. For example, do not use pliers instead of a hammer; use only a hacksaw to cut.
3. Keep the tools in working condition and ensure the required maintenance.
4. Ensure that the necessary protective equipment are available.
5. Follow safety methods while using electrical wires.
6. Use kerosene oil for removing dust from rusty nuts.



EXPERIMENT-1

Aim: To cut the given Galvanized Iron (GI) pipe to the required length & perform threading as per the given sketch.

Material Required: Galvanized Iron pipe 1/2, Coupling 1/2, Elbow 90' 1/2

Tools required:

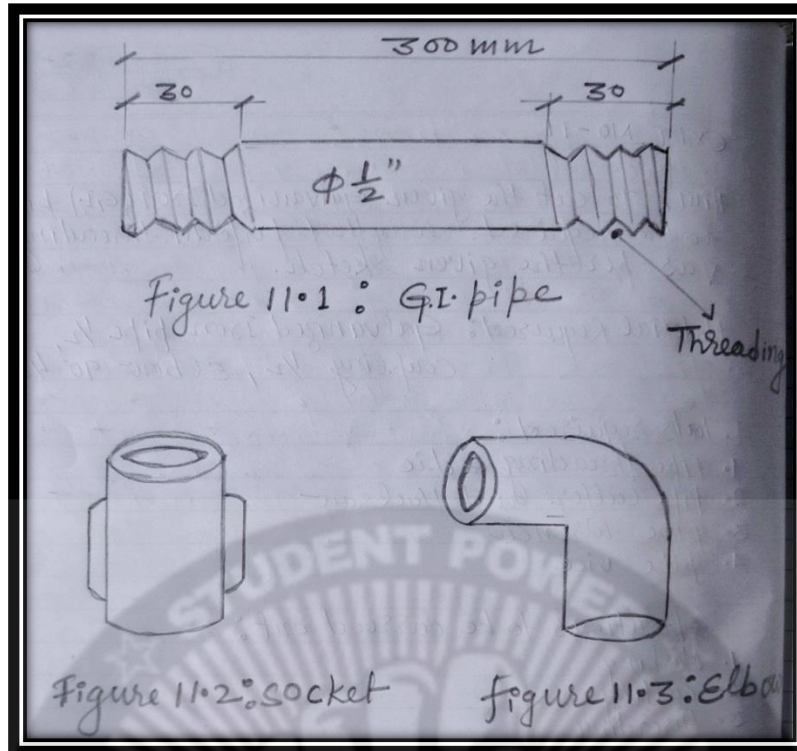
1. Pipe threading & die
2. Pipe Cutter and Hacksaw
3. pipe Wrench
4. pipe vice

Operations to be carried out:

1. Marking
- 2 cutting
3. Threading
4. Testing
5. Finishing and Assembling socket and elbow

Procedure:

1. The given Galvanized Iron pipe is fixed in the pipe vice and cut to the required length.
2. Die set of suitable size is fixed in the die holder. The two set screws are adjusted such that the pipe slightly enters into the die set.
3. The die holder is gradually rotated in the clock wise direction completely so that threads are formed on the pipe up to the required length. The threads so formed are known as British Standard pipe (BSP) threads in accordance with the die set used.
4. The die set is withdrawn from the pipe by rotating the die holder in the counter clock wise direction.
5. The quality of the threads is tested by fitting the threading end with a socket. If the two are not fitted properly, the set screw on the die holder are readjusted and threading is performed again until the desired. results are obtained.
6. The above procedure is repeated on the other side of the pipe and the threads are checked by fittings with an elbow.



Safety Precautions:

1. The die sets are lubricated periodically during threading operation.
2. Over handling of the pipe with die should be avoided.
3. Excessive pressure should not be applied on the die holder.
4. The tools should be handled properly.

Result:

Thus, the plumbing of pipe (PVC) threading is done successfully.

Conclusion:

From the above experiment we studied about plumbing with using tools and cut the given Galvanized iron pipe to be required length perform threading as per the given sketch.



EXPERIMENT-2

Aim: Pipe Cutting, threading and fitting as make three-way function TEE EQL with half of elbow with bib cock.

Material Required:

1. Galvanized Iron pipe 1/2"
2. Galvanized Iron Tee EQL 1/2"
3. Galvanized Iron Elbow 90° 1/2"
4. Galvanized Iron coupling 1/2"
5. BIB Cock and Brass

Tools Required

1. Pipe threading (Die set)
2. Pipe cut cutter and Hacksaw
3. Pipe Wrench
4. Pipe vice
- 5 Oil can cutting oil

Operations to be carried out:

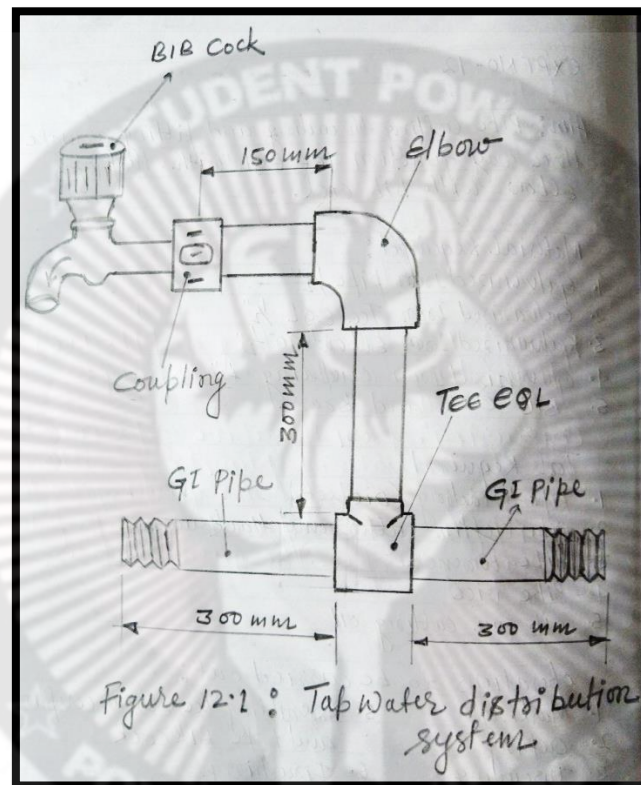
1. Marking
2. Cutting
3. Threading
4. Testing
5. Assembling Tee Elbow coupling and pipe BIB cock
6. Finishing

Procedure:

1. First take a long-galvanized Iron pipe and fix its to a pipe vice.
2. cut the pipe into required length of 15cm or 30cm with the help of hack saw.
3. Set the die screws of suitable size in the die holder and adjust the two screws.
4. The length of pipe 60cm is fixed into the pipe vice and the pipe is place into the die holder and is gradually rotated to the clockwise direction one or two times up to 20mm.
5. Then a retched die is used to get perfect (BSP) external threads.
6. Next a TEE EQL is fixed and checked whether the threads formed are correct



7. Now at the other end of the pipe threads are formed following the above procedure and elbow at 90° is fixed.
8. Next take two 30 cm pipes and form threads to both the ends of both the pipes.
9. One end of one pipe is fixed to one side of TEE equal and one end of the other pipe is fixed to this other side TEE equal.
10. Now a pipe of 15 cm is taken and thread are formed on both the ends of the pipes. To one end a pipe elbow 90° which is connected to 60cm pipe is connected and to the other end of tap is connected.
11. All the fitting is performed by using pipe wrench.



Safety Precautions:

1. The die sits are lubricated periodically during threading operation.
2. Over handling of the pipe with the die should be avoided.
3. Excessive pressure should not be applied on the die holder.
4. The tools should be handled properly.

Result:

Thus, the plumbing of one take was distribution system was constructed.

Conclusion:

From the above experiment we studied about the plumbing hand work with the help of tools.